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GEORGICAL ESSAYS:

IN WHICH 12

The Food of PLANTS is particularly
considered.

And a new COMPOST recommended
upon the Principles of

VEGETATION.

*Search profitable knowledge.*Pythagoras.

L O N D O N :

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1769.

GEORGE'S ESSAYS

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The Power of Plants is particularly

considered

and a new System recommended

to the Use of the People of

AMSTERDAM



Printed by J. Johnson, Strand.

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1789

ADVERTISEMENT.

THE Author of these Essays does not call himself an experienced farmer.—Assisted by philosophy, and a little practical knowledge in rural matters, he has ventured to reduce the Art of Husbandry to some settled principles. — He freely gives his new-invented Compost to the public, in hopes that it may be thought worthy of general notice; but begs that it may be received as a thing unconfirmed by experience, not presuming to esteem his own trials upon it as conclusive.

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THE Author of these Papers does
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ESSAY I.

On the Rise and Progress

OF

AGRICULTURE.

AGRICULTURE is the oldest,
as well as the most useful, of the
arts. In the sacred writings we are
told that Cain applied himself to hus-
bandry, while Abel followed the busi-
ness

ness of a shepherd. The Patriarchs and their descendants employed themselves in feeding of flocks and tilling the ground: but in those early ages the art was as simple as the manners of the people. They lived a wandering sort of life. Every new situation afforded them present support for their flocks; and whenever they met with a fruitful piece of ground, they usually rested upon it, and sowed their corn, which having reaped, they marched forward in quest of another habitation. This was the state of Agriculture when men had no other laws but those of God and nature.

Among

Among the Egyptians, a civilized nation, husbandry was regularly attended to; and it is extremely probable that the children of Israel, before they left that country, had made themselves, in some degree, acquainted with the manner of raising corn, and afterwards preserving it. As soon as their descendants had obtained the full and quiet possession of the promised land, they proceeded upon the plan of the old inhabitants, and became husbandmen.—Every man's possession having been allotted to him, Agriculture seems to have flourished amongst them, otherwise the land of Judea could not possibly have main-

tained the number of inhabitants that are recorded.

If we may credit the report of travellers, the land of Canaan is at present an unfruitful country. The figurative expression of a land flowing with *milk* and *honey*, appears to have sprung more from the industry of the inhabitants, than the natural fertility of the soil. The Phœnicians, or Philistines as they are called, occupied a well-cultivated country bordering upon the sea. By means of their skill in navigation, they exchanged the superfluous product of their lands with the neighbouring nations. Their extent

five commerce is sufficiently known. Being at last driven from their native country, they directed their course to the Mediterranean islands, and carried with them the art of husbandry.

In consequence of this migration, Agriculture became more diffused, and spread its influence over the neighbouring nations.

History informs us that the Greeks were once a most barbarous people. Pelasgus received divine honours for teaching them the use of nut-bearing trees for food. A small colony from Egypt, or Phœnicia, instructed them
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in the manner of growing corn. The Athenians were the first that received the inestimable blessing. Humanity succeeded; and from that source the fine arts derived their origin.

The Romans had a laudable pride in being thought husbandmen. As early as the reign of Numa, public encouragement was given to Agriculture. Succeeding ages continued sensible of its utility. Sound policy informed them, that an extensive territory and a number of inhabitants did not always constitute a great and powerful people. They knew that the lands must be cultivated, and the inhabitants

Habitants must be industrious, before that desirable event could be accomplished. When the Romans made the most illustrious appearance, husbandry was in the highest estimation amongst them. “ In those happy days, says Pliny, the Earth, pleased at seeing herself cultivated by victorious hands, seemed to make stronger efforts, and to produce her fruits in greater abundance.”—But when destructive luxury was introduced, then husbandry declined, and with it fell all the Roman virtue.

The antient writers are the only comments upon the husbandry of their times.

times. Hesiod wrote very early upon Agriculture. He calls his poem "Works and Days." Mago, the Carthaginian General, composed twenty-eight books upon the same subject, which were translated by order of the Roman Senate. Upon these models Virgil formed his elegant precepts of husbandry. Cato, the Censor, wrote a volume upon Agriculture. Columella has left us twelve books upon rural matters. Varro's treatise will ever be esteemed. Many other Greek and Latin authors might be produced; but these will be sufficient to shew, that Agriculture has ever been attended to by

by the wise Philosopher and the good Citizen.

In our days we have the pleasure to see Agriculture under the protection of the great. The wise Sully calls it one of the breasts from which the state must draw its nourishment. That great man could not possibly have given us a more happy simile. He prevailed upon his countrymen to cultivate the art; but their industry was of short duration. The public troubles soon put an end to Arts, Agriculture, and Commerce. — Colbert entertained a different notion of policy. Esteeming Manufactures and Com-

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merce

merce as the sinews of the state, he gave all possible encouragement to the Artizan and the Merchant,—but forgot that the Manufacturer must eat his bread at a moderate price. The Farmer being discouraged, the necessaries of life became dear;—the public granaries were ill stored;—manufactures languished;—commerce drooped;—a numerous army soon consumed the scanty harvest; and, in a short time, Industry fell a sacrifice to the ill-judg'd policy of the Minister.

From that period to the present, the French nation have constantly been availing themselves of their mistake.

Under

Under the genial influence of the King, Societies are erected in every province. Men of the first distinction do not disdain the cultivation of their own lands. M. de Chateauvieux and Duhamel are the greatest ornaments of their country.—Let us imitate that fashionable nation. Let us advise the busy courtier to retire into the country, where he will find peace and plenty. Instead of hunting a shadow through the mazes of a court, bid him leave his ribbon where he found it, and join Hesiod and Mago, Virgil and Cato, from whom one honest look is worth all the smiles of the drawing-room.

Under the genial influence of the
King, societies are created in every
township. Men of the first distinction
do not disdain the position of their
own lands. Mr. de Chambray and
Duchamp are the greatest ornaments
of their country. I do not hesitate to
say, however, that they are the
only persons to whom we can
say, where he will find peace and
pleasure. Instead of drawing a breath
through the mazes of a court, bid him
leave his ribbon where he found it
and join Hédou and Mère, Yvign and
Cano, from whom one never looks
worth all the smiles of the drawing-
room.

ESSAY II.

On the Nourishment of Vegetables.

THE art of Husbandry boasts an origin coeval with the human race. Its age, however, seems to have contributed but little towards its advancement, being at present extended but a few degrees beyond its primitive institution.

Until the philosopher condescends to direct the plow, Husbandry must remain in a torpid state. It is the peculiar

culiar happiness of this age, that men of a liberal education begin to cultivate this art with attention. We cannot say too much in praise of the respective societies lately established in this island, and in France, for the improvement of Agriculture.—They have raised a noble spirit of emulation among our country gentlemen and sensible farmers. Each seems envious of contributing something towards the general stock of knowledge. Such a pleasing intercourse cannot fail of spreading the improvements in Agriculture over the most distant parts of this island.

I take upon me to say, that, to be a good husbandman, it is necessary to be a good chymist. Chymistry will teach him the best way to provide nourishment for his respective crops, and, in the most wonderful manner, will expose the vegetable system of nature to his view. The principles of Agriculture depend entirely upon chymistry: and without principles, what is art, and what is science?

It is also necessary for the husbandman to be a good mechanic, in order to be a judge of the instruments employed in dividing and loosening the soil; an operation of the greatest use to the farmer.

The

The ingenious Dr. Home has opened to our view a noble field for improvement. His reasoning is just and conclusive; but it were to be wished that his experiments had been conducted upon a larger scale. However, contracted as they are, they will be found of great use to whoever intends to pursue the study of Agriculture upon rational principles.

As I intend the nourishment of plants to be the subject of this essay, it will be proper to observe, that I have been directed in my researches by a strict attention to the analogy that subsists between animals and vegetables.

getables. We know that neither of them can subsist long without air and nourishment. Directed by instinct, the animal seeks its own proper food; but the vegetable, not being possessed of the power of motion, must be satisfied with the nourishment that we give it.

To direct this upon rational principles is the business of the philosopher. The practical farmer will suffer himself to be instructed, as soon as he perceives the practice correspond with the theory laid down to him. Let us expect no more from him. Men of a limited education commit great errors

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when they attempt to reason upon science. In husbandry, effects are constantly applied to improper causes. Hence proceed the errors of our common farmers. To overcome these is the peculiar province of the philosopher; who, in his turn, must support his reasoning by facts and experiments.

I lay it down as a fundamental maxim, that all plants receive their principal nourishment from oily particles incorporated with water, by means of an alkaline salt or absorbent earth. Till oil is made miscible, it is unable to enter the radical vessels of vegetables; and, on that account, providence
has

has bountifully supplied all natural
 soils with chalky, or other absorbent
 particles. I say natural soils, for those
 which have been assisted by art are
 full of materials for that purpose; such
 as lime, marle, soap-ashes, and the vo-
 latile alkaline salt of putrid dunghills.

It may be asked, whence do virgin
 soils receive their oily particles? I an-
 swer, the air supplies them. Corrup-
 tion, or, in other words, a putrid fer-
 mentation, attenuates the animal and
 vegetable oils. Being thus heated and
 minutely divided, they are carried up-
 wards into the air, and readily descend
 with the rains and dews. Earth, how-

ever minutely divided, has but a small share in the nourishment of plants. Water is little more than a necessary vehicle. I speak of elementary water.

All rich soils, in a state of nature, contain oil; and in those lands which have been under the plow for some years, it is found in proportion to the quantity of putrid dung that has been laid upon them, making an allowance for the crops they have sustained.

To set this matter in a clearer light, let us attend to the effects of manures of an oily nature, and we shall soon be satisfied

satisfied that oil is one of the chief things concerned in vegetation.

Rape-dust, when laid upon land, is a speedy and certain manure, though an expensive one, and will generally answer best where the land has been moderately limed.

Soot has the same property, and is also an oily manure; but different from the former, containing alkaline salt in its own nature, calculated as well for opening the soil, as for rendering the oily parts miscible with water.

It

It is observed that pigeons dung is a rich and hasty manure. These animals feed chiefly upon grains and oily feeds; it must therefore be expected that their dung should contain a large proportion of oil.

The dung of stable-kept horses is also a strong manure, and should not be used until it has undergone a putrid fermentation, in order to mix and assimilate its oily, watry, and saline parts. Beans, oats, and hay, contain much oil. The dung of horses, that are kept upon green herbage, is of a weaker kind, containing much less oil. Swines dung is of a saponaceous and
oily

oily nature, and perhaps is the richest of the animal manures. When applied with judgment, it is excellent for arable lands.

Human excrement is full of oil and a volatile alkaline salt. By itself, it is too strong a manure for any land; it should therefore be made into a compost before it is used. The dung of carnivorous animals is plentifully stored with oil. Animals that feed upon seeds and grains come next, and after them follow those which subsist upon grass only.

To suit these different manures to their proper soils, requires the greatest judgment

judgment of the farmer; as what may be proper for one soil, may be highly detrimental to another.

In order to strengthen my argument in favour of oils being the principal food of plants, I must beg leave to observe, that all vegetables, whose seeds are of an oily nature, are found to be remarkable impoverishers of the soil; such as hemp, rape, and flax: for which reason, the best manures for lands worn out by these crops, are such as have a good deal of oil in their composition; but then they must be laid on with lime, chalk, marle, or soap-ashes, so as to render the oily particles miscible with water.

It

It is usual to talk of the salts of the earth; but chymistry has not been able to discover any salts in land which has not been manured, though oil may be readily obtained from every soil, the very sandy ones excepted.

Marle, though a rich manure, has no salts. It is thought to contain a small portion of oleaginous matter, and an absorbent earth, of a nature similar to limestone, with a large quantity of clay intermixed.

Lime mixed with clay comes nearest to the nature of marle of any factitious body that we know of, and may

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be

be used as such, where it can be had without much expence. By increasing the quantity of clay, it will make an excellent compost for a light sandy soil; but to make the ground fertile, woollen rags, rotten dung, or any greasy manure, should be incorporated with it some time before it is laid on.

It is a received opinion, that lime enriches the land it is laid upon, by means of supplying a salt fit for the nourishment of plants; but by all the experiments that have been made upon lime, it is found to contain no kind of salt. Its operation therefore should be

con-

considered in a different light. By the fermentation that it induces, the earth is opened and divided, and, by its absorbent and alkaline quality, it unites the oily and watery parts of the soil. It also seems to have the property of collecting the acid of the air, which it readily forms into a neutral salt, of great use in vegetation.

From viewing lime in this light, it is probable that it tends to rob the soil of its oily particles, and in time will render it barren, unless we take care to support it with rotten dung, or other manures of an oily nature.

As light sandy soils contain but a small portion of oleaginous particles, we should be extremely cautious not to overdo them with lime; unless we can at the same time assist them liberally with rotten dung, woollen rags, shavings of horn, and other manures of an animal kind. Its great excellence however, upon a sandy soil, is by mechanically binding the loose particles, and thereby preventing the liquid parts of the manure from escaping out of the reach of the radical fibres of the plants.

Upon clay the effect of lime is different; for by means of the gentle
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fermentation that it produces, the un-
subdued soil is opened and divided;
the manures laid on readily come into
contact with every part of it; and the
fibres of the plants have full liberty to
spread themselves.

Under such agreeable circumstances,
the air, rains, and dews are freely ad-
mitted, and the soil is enabled to re-
tain the nourishment that each of them
brings. In consequence of a fermenta-
tion raised in the soil, the fixed air is
set at liberty, which in a wonderful
manner promotes vegetation.

To the universal principle, oil, we
must

must add another of great efficacy, though very little understood; I mean the nitrous acid of the air.

That the air does contain the rudiments of nitre, is demonstrable from the manner of making salt-petre, in the different parts of the world. The air contains no such salt as perfect nitre; it is a factitious salt; and is made by the nitrous acid falling upon a proper matrix. The makers of nitre form that matrix of the rubbish of old houses, fat earth, and any fixed alkaline salt. The universal acid, as it is called, is attracted by these materials, and forms true nitre, which is rendered
pure

pure by means of crystallization, and in that form it is brought to us. In very hot countries the natural earth forms a matrix for nitre, which makes the operation very short.

It is observed that nitre is most plentifully formed in winter, when the wind is northerly: hence we may understand the true reason why land is fertilized by being laid up in high ridges during the winter months. The good effects of that operation are wholly attributed to the mechanical action of the frost upon the ground. Light soils, as well as the tough ones, may be exposed in high ridges, but with some

some limitation, in order to imitate the mud walls in Germany, which are found, by experience, to collect considerable quantities of nitre during the winter.

After saying so much in praise of nitre, it will be expected that I should produce some proofs of its efficacy, when used as a manure. I must confess that experiments do not give us any such proofs. Perhaps too large a quantity has been used, or rather, it could not be restored to the earth with its particles so minutely divided, as when it remained united with the soil, by means of the chymistry of nature.

ture. I shall therefore consider this nitrous acid, or, as philosophers call it, the *acidum vagum*, in the light of a vivifying principle, with whose operation we are not yet fully acquainted.

I have already observed, that there subsists a strong analogy between plants and animals. Oil and water seem to make up the nourishment of both. Earth enters very little into the composition of either. It is observed, that animals take in a great many earthy particles at the mouth, but they are soon discharged by urine and stool. Vegetables take in the smallest portion imaginable of earth,

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and

and the reason is, because they have no way to discharge it.

It is highly probable, that the radical fibres of plants take up their nourishment from the earth, in the same manner that the lacteal vessels absorb the nutriment from the intestines; and as the oily and watery parts of our food are perfectly united into a milky liquor, by means of the spittle, pancreatic juice, and bile, before they enter the lacteals, we have all the reason imaginable to keep up the analogy, and suppose that the oleaginous and watery parts of the soil are also incorporated, previous to their being taken

taken up by the absorbing vessels of the plant.

To form a perfect judgment of this, we must reflect that every soil, in a state of nature, has in itself a sufficient quantity of absorbent earth, so as to be able to incorporate its inherent oil and water; but when we load it with fat manures, it becomes essentially necessary to bestow upon it, at the same time, something to assimilate the parts. Lime, soap-ashes, kelp, marle, and all the alkaline substances, perform that office.

To render this operation visible to

the senses; take seven ounces of water, dissolve in it one drachm of pot-ash, then add a spoonful of oil. Shake the mixture, and it will instantly become an uniform mass of a whitish colour, adapted to all the purposes of vegetation.

This easy and familiar experiment is a just representation of what happens after the operation of Burn-baking, and consequently may be considered as a confirmation of the hypothesis advanced.

Let us attend to the process.

The sword being reduced to ashes,

a fixed alkaline salt is produced. The moisture of the atmosphere soon reduces that salt into a fluid state, which mixing with the soil, brings about an union of the oily and watery parts, in the manner demonstrated by the experiment.

When the under stratum consists of a rich vegetable mould, the effects of Burn-baking will be lasting. But when the soil happens to be thin and poor, the first crop frequently suffers before it arrives at maturity.

The farmer therefore, who is at the expence of paring and burning a
thin

thin soil, should bestow upon it a portion of rotten dung, or shambles manure, before the ashes are spread, in order to supply the deficiency of oily particles.

In consequence of this prudent management the crop will be supported during its growth, and the land will be preserved in health and vigour.

For such weak lands, it is highly probable that the oil compost described in the next essay, will be found the cheapest and most effectual manure.

Hitherto

Hitherto I have considered plants as nourished by their roots. I shall now take a view of them as nourished by their leaves. An attention to this part of the vegetable system is essentially necessary to the rational farmer.

Vegetables that have a succulent leaf, such as vetches, pease, beans, and buck-wheat, draw a great part of their nourishment from the air, and on that account impoverish the soil less than wheat, oats, barley, or rye, the leaves of which are of a firmer texture.

Rape and hemp are oil-bearing plants,

plants, and consequently impoverishers of the soil; but the former less so than the latter, owing to the greater succulency of its leaf.

The leaves of all kinds of grain are succulent for a time; during which period the plants take little from the earth; but as soon as the ear begins to be formed, they lose their softness, and diminish in their attractive power.

The radical fibres are then more vigorously employed in extracting the oily particles of the earth, for the nourishment of the seed. Such, I apprehend, is the course of nature.

ESSAY

ESSAY III.

On a rich and cheap Compost, &c.

IN the last essay I endeavoured to prove that oil, made miscible with water, constitutes the chief nourishment of vegetables. A greater number of experiments might have been produced in support of that doctrine; but I flatter myself that those already advanced will be thought sufficient.

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Being

Being satisfied that my theory was just, I employed myself in finding out a compost that would come cheap to the farmer, and be of easy carriage. In the course of investigation I took care to reason upon proper data, carefully avoiding every degree of partiality to my system.—In philosophy nothing is so delusive as prejudice.

After making various trials, I at last discovered what I so ardently fought after; but as I have not the vanity to think my experiments sufficiently conclusive, I embrace this opportunity to request the assistance of the practical farmer,

farmer, in order that the merits of the invention may be fully determined.

Should my theory concerning the food of plants be found erroneous, the compost will of course be disregarded. But on the contrary, should it be clearly proved that oil, made miscible with water, constitutes the chief nourishment of vegetables, then the invention will probably be esteemed a valuable acquisition to Agriculture.

Though theory may direct our enquiries, yet experience must at last determine our opinions, for which reason I propose to enlarge my experi-

ments in the spring; and as I have no other view but the investigation of truth, I shall lay them faithfully before the public, whether they prove successful or not.

We know that a number of experiments, made by different persons and in different places, are essentially necessary towards establishing the truth of any received opinion in Agriculture. How much more necessary is it to request the assistance of the practical farmer, in determining the merits of a new invention? for such I esteem the compost that I here communicate.

Virgil,

Virgil, indeed, has recommended the lees of oil as a manure, and the ingenious Dr. Home has mentioned olive oil; but neither of them reflected upon the absolute necessity of rendering the oil miscible with water, by means of an alkaline salt.

I judge it unnecessary to repeat what I have already advanced upon the food of plants. I shall therefore refer the reader to the second essay, as it contains the greatest part of the reasoning upon which the following compost is founded.

To

To make Oil-Compost.

	l.	s.	d.
Take North-American pot-ash 9lb.	0	3	6

Break the salt into small pieces, and put it into a glazed earthen vessel with three gallons of water. Let the mixture stand four hours; then add seven gallons of coarse train oil. - - - - -

0	11	8
£.	0	15 2

In twenty-four hours the salt will be dissolved, and the mixture, upon stirring, will become nearly uniform.

Take one bushel of lime slacked and screened, five bushels of sand, or eight of dry mould; mix them together, and then add the above liquid ingredients. In a few days the composition will be dry enough for use.

When the liquid ingredients are put to one or two hogsheds of water, a liquid compost will be formed, which must be used with a water-cart.

I apprehend that the above quantity will be found sufficient for an acre;

my

my trials, however, do not give me sufficient authority to determine upon this point.

I presume that this compost resembles the natural food of plants; but I submit that, as well as every thing else, to experience, our unerring guide.

It may be objected that it has not undergone the putrid ferment, to attenuate the oily particles. The use of rape-dust, foot, horn shavings, and woollen rags take off that objection, and at the same time confirm the theory upon which the above compost is founded.

I do not take upon me to direct the experienced farmer in the manner of using this new compost. I would have every person apply it in the way most agreeable to himself. Many things will occur to the practical husbandman, that no reasoning of the philosopher could foresee. By attending to the different ways of using it, we may reap considerable advantages. Improvements may be collected even from the highest degree of mismanagement.

Facts must ever be the foundation of our reasoning. Without them the philosopher is a kind of *Ignis fatuus*.
Instead

Instead of unfolding nature he covers her with a cloud, and endeavours, as it were, to bring old Chaos back again into the world.

Should I presume to instruct the farmer in the management of the compost, I would recommend it to be sown immediately after the grain, and both harrowed in together.

My experiments teach me, that all kinds of soils may be benefited by this manure. The limestone, gravelly, sandy, and chalky soils seem to require it most. The rich loams and good clays have nourishment within

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them-

themselves, and stand more in need of the plow than the dunghill.

Pigeons dung is an established manure for wheat in the spring. The oil-compost will probably answer the same purpose ; but, when used as such, I would advise the lime to be omitted, and only one half of the pot-ash to be used, lest the caustic quality of the salt should injure the tender corn.—Of this branch of husbandry I do not speak from experience.

Agreeable to the theory advanced in the second essay, I presume that all lands, which have been exhausted by frequent

frequent crops, are robbed of their oily particles, and consequently have become barren. The oil-compost, as it plentifully restores particles similar to those that are carried off, has a fair appearance of proving an excellent restorative. To lands under such circumstances, lime is the worst manure that can be applied.

This last observation naturally leads me to wish for a general history of manures, upon sound and rational principles. I cannot help regarding that necessary part of husbandry as a subject but imperfectly understood. Whoever succeeds in that difficult

task, will prove himself a real friend to mankind. Without it, Agriculture must remain a vague and uncertain study.

ESSAY

ESSAY IV.

*On a new Method of cultivating weak
Arable Lands.*

HAVING thus, in the plainest
and most concise manner, delivered my sentiments with regard to the nourishment of plants, and at the same time made a discovery of a new compost, which I flatter myself will be found of great utility, I was desirous of taking leave of the public; but as I am sensible that some people may
object

object to the seeming deficiency of practical reading, I shall, for their satisfaction, conclude these essays with an account of a new method of cultivating weak arable lands.

It will be almost unnecessary to observe, that such lands have ever been restored by means of a fallow, which the judicious husbandman makes more or less frequent, in proportion to the poverty of the soil.

Upon the high wolds in Yorkshire, where the soil is poor and thin, oats and barley are principally cultivated. The usual husbandry, in open field land,

land, is one crop and a fallow; and in some places, where there is a greater poverty of soil, they are content with a single crop, and then let the land rest for some years to recover itself. This last is something like the husbandry of the wild Arabs.

Being greatly dissatisfied with the above modes of cultivation, I employed myself, some years ago, in forming another, which might be more consistent with the laws of vegetation, as well as economical husbandry. The system that I have adopted is as follows.

Instead

Instead of having the lands laid out in broad ridges, I order them to be made only nine feet wide. When the seed-time comes I sow every other land broadcast, and harrow in the grain in the usual manner. The intermediate spaces, which I call the fallow lands, are plowed two or three times, at proper seasons, by a light plow drawn by one horse, in order to make a clean fallow for the succeeding crop. Upon these lands the seed is sown as before. The stubble in turn becomes the fallow, and is treated accordingly. In this alternate way I manage weak arable lands, and I have the satisfaction to find that very little manure is

re-

required; which is a most agreeable circumstance, as such lands are generally remote from a large town. I dare venture to say, that the same field, managed in this alternate way for eight or nine years, will be found to produce one third part more profit than when cultivated in the usual manner.

To account for the advantages of this culture, we need only reflect that vegetables, no more than animals, can continue long in a state of health without the free enjoyment of air. In a large field, when the weather is calm, the air remains in a state of stagnation,

tion, whereby the perspiration of the plants is permitted to continue too long upon the ears of corn. Hence many inconveniences arise to the crop. On the contrary, in the alternate husbandry, the air is constantly in motion. The intermediate fallows serve as funnels to carry it off, and, along with it, all superfluous moisture.

In consequence of this freedom of air, upon which I lay a great stress, the ears of corn are always observed to be well fed, and the stalks firm and strong. When by severe weather the corn happens to be lodged, it is thrown upon a clean fallow, where it has no chance
of

of being bound down by weeds. It is consequently sooner raised by the current of air which is constantly passing along the fallows.

It is, however, the particular happiness of this method of cultivation, that the corn is seldom laid, even in the most stormy weather.

Turnips, or, when the soil is deep and sandy, a few carrots or potatoes, may be placed upon the intermediate lands; but I have always found it best to keep them as perfect fallows. Every thing that grows takes something from

the soil; and as our land is supposed to be poor, and not supported with much manure, we ought not to suffer the smallest vegetable to take root upon it.

If the farmer chuses he may vary his crops; but I am of opinion, and I speak from some experience, that the same grain may be cultivated, as long as he pleases, upon lands managed in the manner that I have recommended. In consequence of this happy disposition of the soil, every kind of grain may be suited to the land most proper for it. I do not confine the alternate husbandry to oats, barley, and rye. I have

have successfully followed it upon good wheat land; and if the farmer attends to his business, he will find his wheat crops greatly to exceed his expectations. Upwards of twenty bushels of wheat may be got annually from one acre of good land, cultivated in this alternate way, and with little expence of manure.

I acknowledge that many of these advantages are in common with the drill husbandry; but I flatter myself that there are others which that ingenious system does not enjoy.

I know it will be objected, that in
this

this manner the fallows will be lost to the sheep during the summer months. I answer, so much the better. If possible, the fallows should not be permitted to bear a single leaf. The farmer ought to find other ways to support his sheep, and, if he is an intelligent man, he will readily do it. It is an odd kind of husbandry, when the fields bear corn one year for the owner, and the next weeds for his sheep.

During the summer months the atmosphere is full of putrid exhalations, arising from the steam of dunghills, the perspiration of animals, and smook. Every shower brings down these oleaginous

ginous particles for the nourishment of plants.

When they happen to fall upon a very sandy soil, the solar heat exhales the most of them. Hence the necessity of frequently turning over our fallow lands in summer.

On the contrary, when they fall upon land that has been limed, an intimate union is produced, too strong for the natural heat to resolve.

I have already observed, that lime mechanically binds a hot sandy soil. We now see that it also fertilises it; but
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the farmer must not presume too much upon that quality.

As far as my experiments have gone, I can recommend the oil-compost as an excellent manure for lands under the cultivation of the alternate husbandry.

When first I practised this new culture, I was apprehensive that the pigeons and crows would prove my greatest enemies, by settling upon the fallow lands, and pulling down the ears of corn. I have now the pleasure to assure the public, that, after some years experience, I find my lands no
more

more liable to those depredations than the neighbouring ones.

The lands cultivated in this way, being clear of weeds, require consequently but little manure. They are always in excellent tilth, and as their surface is frequently changed, they have every opportunity of drinking up the nutritious matter of the atmosphere.

I have the satisfaction to find that inclosures are begun upon the Lincolnshire and Yorkshire Wolds; in consequence of which a greater quantity of corn will be produced for a few years

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than formerly. To such gentlemen as have estates in those countries, or in similar ones, I beg leave to recommend the alternate husbandry. I dare venture to say, that, in point of profit and convenience, it will be found greatly superior to the drill husbandry. The implements used are those of the country, and the mode of cultivation is within the capacity of the meanest plowman. 4 OC 58

F I N I S.

